

Reliability Achievement Through the Technical Risk Assessment

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Abstract

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In today's business and economic environment, the primary goal of a manufacturer is to produce a quality product with the minimum possible cost. To achieve this goal, reliability is thought of at the beginning of product making, in design, with the reliability vs. cost trade off using the technical risk assessment as a tool. A technique for reliability vs. cost tradeoff is being developed at JPL as a NASA sponsored project "J'ethnical Risk Assessment. The concept of this technique has been peer reviewed and is a topic of this paper.

Risk contributors (drivers) are identified for the specific product type. Many of the risk contributors are general, and can be related to any product, i. e., parts quality, design stress (worst case) analysis, test levels vs. use environment, radiation hardening or shielding vs. radiation environment, etc. The effect of each risk driver is then represented in a form of a mathematical algorithm, which is then related to the desired or required mission reliability, and cost. The highest un-reliability contributors are then evaluated to reduce the mission risk. The risk reduction cost of lower risk individual contributors is evaluated to address those that can be reduced with the least or reasonable cost to minimize overall spacecraft technical risk.

The technical risk assessment is thus to be used as a tool for risk identification and the assessment of the risk magnitude, to enable an effective risk vs. cost tradeoff.